under guidance in order to study areas chosen as illustrating different types of mineral deposits. The course has also been so arranged that it can be taken in a post-graduate year by those who have already completed the associateship in the subjects of mining.

THE main heads of the School Teachers' Superannuation Bill, which Mr. Fisher hopes to introduce in the House of Commons in the autumn, have been published as a Parliamentary paper (Cd. 9141). The Bill will bring within one comprehensive system of State pensions, on a non-contributory basis, both certificated and uncertificated teachers in elementary schools, as well as the teachers in all other schools aided by the Board of Education, including those training colleges which are not departments of universities. The benefits will consist of annuities, together with lump sums, for those who retire at the age of sixty or later after thirty years of service, and for those who retire disabled after ten years' service; and of gratuities payable on the death of a teacher in service after five years of service. No difference will be made between the sexes in the conditions of pension, except that in order to provide for women teachers leaving the profession to be married and afterwards returning to it, provision is made for the substitution of twenty years' service for thirty as a condition of pension in such cases. Pension service will, as a rule, cease at sixty-five. Service to be pensionable must be full-time service in schools which are grant-aided at the time of service, or in secondary schools which, though not grant-aided at the time, become grant-aided within five years of the passing of the Bill Power is reserved to the Board of Education, however, to reckon as pensionable service a limited amount of service in certain other schools rendered before the commencement of the operation of the Bill. Other matters dealt with in the Bill include medical examination for future teachers before admission to recognised service and the power to withhold or reduce benefits in case of misconduct.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 12.—M. P. Painlevé in the chair.—J **Boussinesq**: Confirmation of the principle of the approximate theory of punching for a thick block.—G. **Bigourdan**: The observatories of the Harcourt College, to-day the Lycée Saint-Louis.—H. **Douvillé**: The strata containing Orbitoids in North America.—E. **Ariès**: The saturated vapour pressures of bodies containing a large number of atoms in the molecule. The formulæ developed in previous papers for substances containing from one to eight atoms in the molecule are now applied to pentane, hexane, heptane, and octane, and the calculated vapour pressures compared with the experimental results of Young and of Young and Thomas.—J. **Comas-Solà**: Stereoscopic studies of stellar currents. Two pairs of negatives, taken 1912–18 and 1916–18, have been examined by the stereoscopic method, and show that for stars of the first ten magnitudes a proper motion in the form of a current is general.—G. **Fayet**: The third appearance of the periodic Borrelly comet. This was seen at Nice on August 6–7.—M. **Baillaud**: Note on the same. Positions given for August 7 and 10.—R. **Combes**: The immunity of plants with regard to the immediate principles which they elaborate. The saponine of *Agrostemma githago* (agrostemmasaponine) in concentration as low as 1 : 10,000 behaves as a poisonous substance for the roots of plants not producing this glucoside (pea, buckwheat, radish), but exerts no toxic action even with a much higher concentration, 1 : 100, on the roots of *Agrostemma githago*.—J. **Dumont**: The aqueous reserves of the soil in periods of drought. Determinations of moisture in soil after drought were made at depths from 0 to 80 cm. from the surface, and for different crops with and without manure.—F. **Maignon**: The influence of fats on the toxic power of the food proteins: their *rôle* in the utilisation of nitrogenous materials. Applications to therapeutics.

SYDNEY.

Royal Society of New South Wales, June 5.—Mr. W. S. Dun, president, in the chair.—C. D. **Gillies**: The spine mode of *Centropyxis aculeata,* Stein. Material for the investigation of the spine variation in the test of this Rhizopod was obtained from six different localities in Queensland. It was found that the spine-frequency polygons were unimodal, and that the empirical mode varied from 3–5. From May, 1916, to December, 1917, material was collected at monthly intervals from the Brisbane Botanic Gardens. The modal value of the polygons was 3, hence for this locality the mode is a constant.—R. W. **Challinor**, E. **Cheel**, and A. R. **Penfold**: A new species of Leptospermum and its essential oil. From evidence accumulated over a period of six or seven years, including the cultivation of a number of plants and the chemical investigation of the essential oil, which is shown to consist principally of the two aldehydes, citral and citronellal, the authors have proved that at least one more of our native tea-trees is new to science, and give the name *Leptospermum citratum* to this new species.—C. **Laseron**: Notes on some Permo-Carboniferous Fenestellidæ, with description of new species. The fossil polyzoa of Australia, though abundant in many formations, are as yet but little known, and this paper deals with ten more or less common forms in the Permo-Carboniferous rocks, mostly in the Hunter River district. Six new species and several old types are described.

July 3.—Mr. W. S. Dun, president, in the chair.—J. H. **Maiden**: A contribution to a history of the Royal Society of New South Wales. The earliest recorded effort to form an improvement society was in the year 1818, when Judge-Advocate Wylde's attempt to form an agricultural society failed because Governor Macquarie demanded the admission of emancipists. In December, 1821, Governor Brisbane formed a scientific club under the name of the Philosophical Society of Australasia. Some of the papers read were printed by Barron Field, while the bronze plate at Kurnell celebrates the foundation of this society and the jubilee of Capt. Cook's visit. This was succeeded by the agricultural society in the following year, which also became a horticultural society in 1826. The author showed the direct descent of the Royal Society of New South Wales from the Australian Philosophical Society, founded January 19, 1850. On July 30, 1855, it was resuscitated under the name Philosophical Society of New South Wales, and received its present title on December 12, 1866.—Prof. H. S. **Carslaw**: Note on the theory of a simple progressive tax, and its bearing on the Federal income-tax schedules. This paper dealt with the system of tax in which the amounts paid on each successive pound form an arithmetical progression, and incidentally showed that without material change in the incidence of the tax such a system could be substituted for the complicated schedules of the Federal Income-Tax Acts.

MELBOURNE.

Royal Society of Victoria, June 13.—Mr. J. A. Kershaw, president, in the chair.—J. T. **Jutson**: The sand ridges, rock floors, and other associated features at Goon-

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garrie, in sub-arid Western Australia. This paper deals with the westerly trend of the lake basins, the cutting back of the hard, rocky bluffs, and the development of parallel sand ridges with well-marked intervening valleys, running in an east-west direction. This latter feature has not before been discussed in detail.—R. A. **Keble**: The significance of lava residuals in the development of the Western Port and Port Phillip drainage systems. The older and newer basalts of Victoria flowed down the valleys, partly occupying or completely submerging them. Subsequent erosion took place on the softer flanking rocks in the case of the confined lava-fields. In the case of the extensive lava-fields erosion proceeded along the pre-basalt watersheds, since they were the first to be exposed by vertical erosion, and afforded the line of least resistance. It is submitted that it is possible to reconstruct from these data the pre-basalt stream systems.—F. **Chapman**: The age of the Bairnsdale Gravels, with a note on the included fossil wood. The sheet of gravel covering the uplifted coastal plain of the Victorian coast from the hill-ranges of South Gippsland on the west to Cape Howe on the east is described, and shown to be of Wernikooian (Upper Pliocene) age. Its terrestrial origin is proved by the physiography of the surrounding country and the nature of the deposits, whereas, if of marine origin, the sand would have been largely removed by continuous tidal action. The included fossil (silicified) wood is referred to two types of Eucalypts, the nearest allies of which are yellow box (*Eucalyptus melliodora*) and white stringy bark (*E. piperita*). The wood is derived from an older formation, Kalimnan (Lower Pliocene) or even Janjukian (Miocene).

CALCUTTA.

Asiatic Society of Bengal, July 3.—J. N. **Rakshit**: The isolation of porphyroxine. A solution of opium in lime-water is shaken up with ether, and the ethereal extract dried over calcium chloride and evaporated; the residue thus obtained is washed with boiling petroleum, dissolved in dilute hydrochloric acid, filtered, the filtrate made alkaline with sodium bicarbonate, again filtered, and the alkaline filtrate extracted with chloroform. On evaporation of the chloroform extract crude porphyroxine is obtained, which, when crystallised from alcohol, gives the pure alkaloid as a pinkish-brown powder.—M. N. **Saha**: A new theorem in elasticity. From the equations of motion of an elastic system, a new theorem has been deduced expressing the difference between mean kinetic and potential energies. The theorem is analogous to Clausius's Virial theorem in the kinetic theory of gases, and appears to be of great promise for the relative estimation of kinetic and potential energies in various cases of vibration.—M. N. **Saha** and S. **Chakravarti**: The pressure of light. A series of experiments which were recently carried out at the Sir T. N. Palit Laboratory of Science for demonstrating, and qualitatively estimating, the pressure of light has been described. The apparatus is a modification of Hull's apparatus for measuring the pressure of light, and is so designed that all disturbing effects have been eliminated. Previous workers used the arc as the source of light, but this being very unsteady, a tungsten filament lamp of 3000 c.p., which gives almost as intense a light as the arc and is absolutely steady, has been used. The observed and calculated pressures are in good agreement.—G. de P. **Cotter**: The geotectonics of the Tertiary Irrawaddy basin. It has been found necessary, through recent field work in the Minbu and Pakokku districts, to modify previous ideas of the Tertiary history of Burma. The author believes that there is no unconformity, except of an entirely local character, between the Pegus and Irrawaddys of the Irrawaddy basin. The supposed unconformities of Yenangyat and Minbu are partly to be explained as missing beds cut out by fold faults. There is evidence of Pleistocene and recent upheaval in the Irrawaddy basin.—E. W. **Vredenburg**: Considerations regarding a possible relationship between the charnockites and the Dharwars. Attention is directed to the possibility of regarding the charnockites as metamorphosed representatives of the igneous members of the Dharwars.—E. W. **Vredenburg**: Note on the occurrence of *Dolium variegatum*, Lamarck, at Maskat, with considerations on its geographical distribution at the present day and in former geological times. *Dolium variegatum*, Lamarck, hitherto known as a recent shell only from Australia, has been noticed in the Indian Museum amongst a collection of shells from Maskat. In a fossil condition it is known from the Upper Tertiary of Java and of the Makran, indicating that its distribution, discontinuous at the present day, was continuous in former geological times.

BOOKS RECEIVED.

Organic Chemistry for Advanced Students. By Prof. J. B. Cohen. Second edition. 3 parts. Pp. viii+366; vii+435; vii+378. (London: E. Arnold.) 54*s*. net.

An Introductory Treatise on Dynamical Astronomy. By Prof. H. C. Plummer. Pp. xix+343. (Cambridge: At the University Press.) 18*s*. net.

Alternating-current Electrical Engineering. By P. Kemp. Pp. xi+494. (London: Macmillan and Co., Ltd.) 17*s*. net.

A History of Chemistry. By Prof. F. J. Moore. Pp. xiv+292. (New York: McGraw-Hill Book Co.; London: Hill Publishing Co., Ltd.) 12*s*. 6*d*. net.

CONTENTS.

PAGE
Waste-paper and Paper-waste 1
The Constitution of Coal. By **Prof. H. Louis** . . . 2
Analysis and Geometry. By **G. B. M.** 2
Our Bookshelf 3
Letters to the Editor:—
German Naturalists and Nomenclature.—**Lord Walsingham, F.R.S.** 4
The Value of Insectivorous Birds.—**Dr. Wm. Eagle Clarke** 4
A Mistaken Butterfly.—**Thos. Steel** 5
Fertilisers after the War. By **Dr. E. J. Russell, F.R.S.** 5
The Value of the Herring as Food. By **E. J. A.** . . 6
The Metalliferous Ores of the Iron and Steel Industry. By **Prof. H. C. H. Carpenter, F.R.S.** . 7
Prof. Bertram Hopkinson, F.R.S. By **Sir J. A. Ewing, K.C.B., F.R.S.** 8
Notes 9
Our Astronomical Column:—
Infra-red Stellar Spectra 13
Mount Wilson Observatory Report 13
The Development of New Industries 13
The British Glass Industry 15
High-temperature Appliances 16
Water-power and its Utilisation 16
University and Educational Intelligence 18
Societies and Academies 19
Books Received 20

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